

City and 103° at *Holton and *Wellington. *Wisconsin*: 40° at *Neillsville, 48° and 90° at La Crosse and 95° at *Manitowoc. *Iowa*: 42° at Ames and Guttenburg, 48° and 93° at Des Moines and 100° at *Boonsboro. *Nebraska*: 36° at *Sidney Barracks, 46° at North Platte, 99° at North Platte and *Sidney Barracks. *Indian Territory*: 56° at Ft. Sill and 104° at Ft. Gibson. *Minnesota*: 44° and 92° at Breckenridge, 96° at *Ft. Snelling. *Dakota*: 41° and 98° at Ft. Buford. *Colorado*: 23° at Pike's Peak, 32° at *Georgetown, 50° and 95° at Denver. *New Mexico*: 48° at Silver City and 104° at La Mesilla. *Wyoming*: 40° and 92° at Cheyenne. *Montana*: 40° and 97° at Ft. Keogh. *Utah*: 46° and 95° at Salt Lake City, 102° at *Kanab. *Nevada*: 45° and 96° at Pioche, 100° at Carson City. *Arizona*: 42° at Prescott, 115° at Yuma. *Idaho*: 46° and 103° at Boise City. *California*: 34° at Campo, 48° at Visalia and 108° at Visalia and Red Bluff, and 121° at *Indio. *Oregon*: 45° and 92° at Roseburg.

Those marked with * are voluntary reports.

Ranges of Temperatures at Signal Service Stations.—The monthly ranges will appear from an examination of the maxima and minima just given. The greatest daily ranges vary in New England from 15° at Wood's Holl, and 26° at Mt. Washington to 30° at Eastport and Springfield. Middle Atlantic States from 16° at Cape May to 26° at Washington. South Atlantic States 13° at Portsmouth, N. C., to 29° at Charleston. Gulf States from 15° at Galveston and New Orleans to 31° at Corsicana. Tennessee and Ohio valley from 20° at Cairo to 31° at Pittsburgh. Lower Lake region, from 21° at Buffalo to 30° at Rochester. Upper Lake region from 21° at Chicago to 34° at Marquette. Upper Mississippi valley from 23° at Davenport to 31° at Des Moines. Lower Missouri valley from 26° at Omaha to 34° at Yankton. Northwest from 39° at Bismarck to 42° at Pembina. Rocky Mountain slope from 24° at Pike's Peak and 27° at Denison and Henrietta to 44° at Santa Fe and 45° at Cheyenne. Rio Grande valley from 25° at Laredo and Rio Grande City to 36° at Brackettville. California, from 29° at San Francisco to 46° at Visalia.

Frost.—2nd Fort Buford; 5th and 15th, Lunenburg, Vt.; 8th and 16th, Cresco, Iowa; 8th, 16th and 17th, at Neillsville, Wis.; 8th, 16th and 24th, at Lansing, Mich.; 16th, cut corn and potatoes in Lansing and surrounding townships badly, and in Locke township killed corn, buckwheat, tomatoes, &c.; 9th (?) Palouse City, Washington Ty., killing vegetables, ice formed but damage not extensive. 9th, Embarrass, Wis., and Fort Stevenson, Dak.; 10th Litchfield and Catawissa, Pa.; 11th Cooperstown, N. Y.; 15th Ontonagon, Mich., "nipping tender vines;" 17th Thornville, Mich.; 29th Winnemucca, Nev., wilting potato and other vines; 30th Georgetown, Col., "water froze 100 feet above the town." Summit, Col., (elevation 11,300 feet) frost every night. 31st Virginia City, Montana.

Ice.—7th Mt. Washington, N. H., $\frac{1}{2}$ of an inch; 9th (?) Palouse City, Washington Ty., $\frac{1}{2}$ of an inch; 16th Locke township, Mich.; 30th near Georgetown, Col.

PRECIPITATION.

General Notes on Precipitation of Month.—The general distribution of rainfall for the month is illustrated as accurately as possible on chart No. III by returns from about 500 stations. In the lower left-hand corner of the chart will be found a table giving the average precipitation for August by districts. In general, the rainfall has been deficient from New England westward to the Rocky Mountains, and in California; in excess from the Middle and South Atlantic States westward to include the Lower Mississippi valley and Texas. The deficiencies were most marked in Minnesota and Missouri. The excess of precipitation has been greatest in the Eastern Gulf States, Ohio valley and the Middle Atlantic States. In the remaining districts, the departure from the normal rainfall has not been marked. None but local droughts have been reported. The deficiencies reported from Minnesota and the Missouri valley compensate for the excess of precipitation during July, while the great excess in the Ohio valley and Western Gulf States, counterbalance the marked deficiencies, which existed in those districts during the previous month.

Specially Heavy Rains.—1st, St. Marks, Fla., 6.41 in.; 2nd, Forsyth, Ga., 2.43 in. in 6 hours; Fort Barrancas, Fla., 2.73 in. in 3 hours 50 minutes; Franklin N. C., 5.90 in.; 3rd, Hudson, Mich., 2.20 in. in 8 hours; 4th, Accotink, Va., 1.40 in. in 9 hours; Morgantown, 2.31 in.; Gainesville, Ga., 3.60 in.; 5th, Keokuk, 2.11 in.; Augusta, Ill., 2.76 in.; Mt. Auburn, O., 2.33 in. in 1 hour 15 minutes; Cincinnati, 1.79 in. in 2 hours 45 minutes; 6th, Indianapolis, 2.05 in.; 7th, Woodstock, Md., 2.35 in. in 9 hours; Mt. Auburn, O., 2.27 in. in 6 hours; 9th, Portsmouth, N. C., 3.69 in.; Cape Lookout, 2.58 in. on the 8th and 9th; Point Pleasant, La., 3.02 in. in 1 hour; 10th, Gulf Hammock, Fla., 2.40 in. in 3 hours; 13th, New Orleans, 2.54 in.; Vevay, Ind., 1.90 in. in 30 minutes; Brookhaven, Miss., 4.50 in. in 13 hours; 14th, Mobile, 3.90 in.; Fort Barrancas, Fla., 6.07 in. in 3 hours and 35 minutes; 15th, Louisville, 2.86 in.; Sandusky, 2.70 in. on the 15 and 16th; Anna, Ill., 4.26 in. in 16 hours; Louisville, Ill., 14th and 15th, 2.50 in.; St. Meurads, Ind., 4.55 in. in 24 hours and 55 minutes; 16th, Erie, 3.11 in.; Rochester, N. Y., 2.65 in.; Oswego, N. Y., 3.14 in.; Cleveland, O., 2.59 in.; 17th, Highland, N. C., 2.00 in. in 8 hours; Fort Barrancas, Fla., 2.73 in.; Lynchburg, Va., 1.04 in.; Cape Lookout, N. C., 4.29 in. on the 17th, and 18th; 18th Atlantic City, N. J., 8.97 in., 6.72 in. in 9 hours; Sandy Hook, N. J., 6.38 in.; New London, Conn., 4.16 in.; New Haven, Conn., 5.12 in.; Norfolk, Va., 6.03 in., 5.13 in. in 9 hours; Wood's Holl, Mass., 2.27 in.; Wilmington, N. C., 8.04 in., 4.38 in. in 8 hours and 35 minutes; Thatcher's Island, Mass., 4.77 in., on the 18th, and 19th; Springfield, Mass., 4.36 in. on the 18th, and 19th; Cape May, N. J., 8.46 in., 6.85 in. in 9 hours; 19th, Mt. Washington, N. H., 2.60 in.; 20th, Fayetteville N. C., 3.50 in. in 1 hour; 21st, Fayetteville, N. C., 2.25 in. in 1½ hours; 22nd, Fort Barrancas, Fla., 3.35 in.; New Orleans, La., 2.11 in.; Mobile,

La., 2.79 in.; Northport, Mich., 3.55 in.; 23rd, St. Marks, Fla., 2.34 in.; Shreveport, La., 3.47 in.; Little Rock, Ark., 4.04 in.; Point Pleasant, La., 22nd, and 23rd, 6.73 in., of which 4.31 in. fell in 24 hours; 24th, Urbana, O., 2.07 in. in 14 hours; College Hill, O., 24th, and 25th, 2.50 in. in 22 hours; Bethel, O., 3.50 in. in less than 24 hours; Mt. Auburn, O., 24th, and 25th, 2.54 in. in 27 hours; Cincinnati, O., 2.68 in. on the 24th, and 25th; New Harmony, Ind., 3.45 in.; Cairo, Ill., 2.98 in.; Louisville, Ky., 3.76 in.; Anna, Ill., 5.08 in. in 12 hours, total of 6.14 in. in 21 hours; Louisville, Ill., 3.00 in. in 12 hours; 25th, Atlantic City, N. J., 2.08 in.; Pittsburgh, Pa., 2.59 in.; Dover, Del., 25th, and 26th, 2.50 in.; Arlington Ind., 24th, and 25th, 2.75 in.; Vevay, Ind 23rd, to 25th, 4.45 in. in 42 hours; St. Meinrads, Ind., 23rd, to 25th, 4.75 in.; Highlands, N. C., 24th, and 25th, 3.47 in.; Wellsburgh W. Va., 2.87 in. in 6 hours; 26th, St. Marks, Fla., 4.46 in.; Accotink, Va., 1.00 in. in 3 hours; 30th, Gulf Hammock, Fla., 2.60 in.; Moorestown, N. J., 17th, 2.78 in. in 24 hours; 17th to 19th, 4.31 in.; Acto, N. J., 16th to 18th, 7.23 in.; Somerville, N. J., 15th to 18th, 5.56 in. in 74 hours; South Orange, N. J., 15th to 18th, 4.60 in.; Vineland, N. J., 16th to 18th, 4.60 in. in 78 hours; Freehold, N. J., 16th to 18th, 7.56 in., of which 5.34 in. fell in 24 hours; Trenton, N. J., 15th to 18th, 5.8 in., of which 4.58 in. fell within 36 hours; Wappinger's Falls, N. Y., 16th to 19th, 3.75 in. in 72 hours; Penn Yan, N. Y., 16th to 19th, 2.60 in. in 18 hours; Ardenia, N. Y., 15th to 18th, 3.30 in. in 72 hours; Boyd's Corner, N. Y., 15th to 18th, 3.68 in. in 71½ hours; Lenoir, N. C., 15th, 16th, 5.50 in. in 43 hours; Fayetteville, N. C., 16th to 18th, 6.00 in., of which 3.00 fell in 18 hours; Greensboro, N. C., 17th, 2.90 in. in 7 hours and 30 minutes; Urbana, Ohio, 15th, 2.06 in. in 20 hours; Little Mountain, Ohio, 15th, 16th, 2.20 in. in 29 hours; Cleveland, Ohio, 16th, 2.46 in. in less than 24 hours; Bethel, Ohio, 15th, 16th, 3.50 in. in 44 hours; Mt. Solon, Va., 15th, 17th, 3.85 in., of which 2.40 in. fell in 4 hours; Accotink, Va., 16th, 18th, 3.05 in., of which 1.60 in. fell in one day; Lake Village, N. H., 18th, 19th, 3.05 in.; Weir's Bridge, N. H., 16th to 19th, 4.08 in.; Belmont, N. H., 17th, 18th, 3.75 in.; Wolfeboro, 18th, 19th, 2.54 in.; Dover Mine, Va., 17th, 18th, 2.45 in. in 16½ hours; Johnstown, Va., 18th, 7.70 in. in 11 hours; Fallsington, Pa., 18th, 2.48 in. in 13 hours, 6.01 in. from 15th to 18th; Egypt, Pa., 18th, 2.80 in.; White Plains, N. Y., 15th to 18th, 4.80 in., of which 3.90 in. fell in 15 hours; Dunbarton, N. H., on the night of the 18th, 3.12 in.; Southington, Conn., from 16th to 19th, 5.40 in.; Sandy Springs, Md., from 15th to 17th, 4.23 in.; Hulmeville, Pa., 16th to 18th, 4.08 in.; Fort Hamilton, N. Y., from 9:00 p. m. of 17th to 9:00 p. m. of 18th, 5.00 in.; Philadelphia, Pa., 16th to 18th, 5.84 in.; Gainesville, Ga., 2.58 in. in 7 hours; Vevay, Ind., 14th to 16th, 3.65 in., (2.95 in. in 13 hours;) Rowe, Mass., 18th, 19th, 2.40 in. in 24 hours; New Market, Md., 17th, 2.79 in. in 36 hours; Lawrence, Mass., 16th to 19th, 5.78 in.; Westborough, Mass., 16th to 19th, 5.47 in. in 70 hours; Somerset, Mass., 18th, 2.36 in. in 15 hours; Mystic, Conn., 18th, 3.00 in.; Dover, Del., 16th to 18th, 7.60 in. in 57½ hours; Newburyport, Mass., 16th to 19th, 4.22 in. in 74 hours; Mystic, Conn., 18th, 1.90 in.; West Waterville, Me., 16th to 19th, 5.25 in.; Mt. Desert, Me., 16th to 19th, 3.10 in.; Gardiner, Me., 16th to 19th, 4.62 in.; Orono, Me., 16th to 19th, 4.80 in.; Mendon, Mass., 16th to 18th, 6.20 in.; Clinton, Mass., 16th to 19th, 5.29 in. in 68 hours; Fall River, Mass., 16th to 19th, 3.40 in. in 66 hours; Springfield, Mass., 16th to 19th, 5.89 in. in 73 hours, 4.28 fell within 24 hours; Antrim, N. H., 16th to 19th, 4.12 in. in 70 hours.

Largest Monthly Rain-falls.—Ft. Barrancas, Fla., inches 25.07; St. Marks, 18.09; Cape May, 16.58; Atlantic City, 14.67; Fayetteville, N. C., 13.25; Gulf Hammock, Fla., 12.77; Punta Rassa, 12.75; Laredo, Tex., 12.59; Arma, Ill., 12.51; Dover, Del., and Franklin, N. C., 12.45; Sandy Hook, 12.44; Barnegat, 12.33; Pt. Pleasant, La., 12.28; Cape Lookout, 11.90; Rio Grande, Tex., 11.75; Cincinnati, 11.72; Bethel, Ohio, 11.62; Wilmington, 11.37; Johnstown, Va., 10.85; Vineland, N. J., 10.63; Mobile, 10.54; New Orleans, 10.44; Centreville, Mo., 10.27; Louisville, Ky., 10.02; Summit of Mt. Washington, 9.55; Ft. McKavett, 7.54.

Smallest Monthly Rain-falls.—Within the line marked zero on chart No. III, including portions of California, Nevada and Arizona, rain has only been reported at two stations, viz; Campo, 0.10 and San Geronia, 0.22; no rain fell at Clark's Fork in central Missouri. The following are the smallest monthly rain-falls reported: 0.01 inch at Carson City, Nev.; 0.02 at San Francisco; 0.03 at Boise City and Umatilla; 0.05 at Knight's Landing and Willows, Cal.; 0.06 at Williams, Cal., Salt Lake City and St. George, Utah; 0.14 at Winnemucca; 0.16 at North Platte; 0.18 at Leavenworth; 0.23 at Virginia City; 0.28 at Red Bluff; 0.4 at Corsicana. East of the Mississippi the lowest rain-falls reported are: 0.64 inch at Port Huron; 0.73 at Ithaca, N. J.; 1.40, Neillsville, Wis; and 1.60 at Decatur, Ala.

Rainy Days.—The number of days during which rain or snow has fallen varies as follows: New England, from 8 to 14; Middle Atlantic States, 10 to 16; South Atlantic States, 10 to 20; East Gulf States, 16 to 18; West Gulf States, 3 to 13; Ohio valley and Tennessee, 5 to 12; Lower Lake region, 8 to 11; Upper Lake region, 5 to 12; Upper Mississippi valley, 8 to 12; Missouri valley, 4 to 11; Red River of the North, 7 to 8; Eastern Rocky Mountain slope, 1 in northern Texas and 4 in western Nebraska to 7 in southwestern Dakota; Rocky Mountains, 2 to 13 and on Pike's Peak, 20; Western Plateau, 4 in Idaho and Utah and 5 in central Arizona to 6 in southeastern Nevada; California, 0 to 2; coast of Oregon and Washington Territory, 3 to 9.

Cloudy Days.—The number varies in New England from 7 to 14; Middle Atlantic States, 6 to 14; South Atlantic States, 7 to 17; East Gulf States, 7 to 13; West Gulf States, 2 to 7; Lower Lake region, 5 to 10; Upper Lake region, 4 to 10; Ohio valley and Tennessee, 6 to 11; Upper Mississippi valley, 6 to 7; Missouri valley 1 to 5; Red River of the North, 2 to 4; eastern Rocky Mountain Slope, 1 in northern Texas, and 2 in southeastern Dakota to 6 in Kansas and Nebraska; Rocky Mountains 0 to 9; North

and Middle Plateau, 2 to 3; Southern Plateau, 0 to 1; California, 0 to 3; coast of Oregon and Washington Ty., 6 to 11.

Hail—But few hail-storms have been reported during the month. The only stations reporting more than one storm are: Pikes Peak, 6; Summit, Col., 7; De Soto and Omaha, Neb., 3. Two states report two separate storms in one day, on the 12th at Ames and Monticello, Iowa; 23rd Bellefontaine and Jacksonburg, Ohio. Hail fell 1st, at Cincinnati and Buffalo; 2nd, Chicago; 6th, Georgetown, Col., Kansas City, Mo., and Wellington, Kan.; 12th, Milwaukee, "large enough to kill fowls;" 13th, Lawrence, Kan.; 14th, Yankton, Dak.; 16th, Chambersburg, Pa.; 21st, Wilsonville, Ala.; 22nd, Mt. Washington; 23rd, Corvuing, Mo., and Freehold, N. J.; 28th, Ft. Keogh, Montana, large size and doing much damage. No hail was reported west of the Rocky Mountains.

Snow—Red Bluff, Cal., 21st, on coast range; on the summit of Pike's Peak, 4th to 6th, 7th, 12th, 13th, 15th, 16th, 19th to 21st, 28th and 29th; Virginia City, 29th, on mountains near; Summit, Col., 13th, 16th, 28th; Carson City, Nev., 28th, on mountains near; Burlington, Vt., 17th, on mountains near, two inches; Mt. Bridger, near Ft. Ellis, Montana.

Droughts—Throughout the month droughts were reported as existing in Utah, the Lower Missouri valley, the Upper Mississippi valley, northeastern part of Pennsylvania, and southeastern Michigan. Droughts commencing late in the month continued on the 31st in eastern Wisconsin, northeastern Illinois and Indiana. The droughts reported as prevailing in Nevada and Texas at the end of July ended in Nevada, excepting in the Humboldt valley, on the 1st of August; in Texas from the 9th to the 12th, except in Navarro county, where creeks and tanks were reported dry and stock suffering dreadfully at the end of August. On Carson river, Nevada, all mills were reported shut down on 22nd, for lack of water.

Floods and Water-spouts—3rd, near Milton, Pa., on the west branch of the Susquehanna; 11th, water-spout at entrance to Pensacola Bay, at 11.20 a. m., course from southwest to northeast; 16th, Mayport, Fla., moved over the sea from southwest to northeast for about four miles, and then broke; 12th to 14th, high water in the Rio Grande river overflowing the valley between Rio Grande City and Brownsville, doing considerable damage.

RELATIVE HUMIDITY.

The percentages of mean Relative Humidity for the month range as follows: New England, 65 to 87; Middle Atlantic States, 71 to 83; South Atlantic States, 69 to 84; Gulf States, 69 to 85; Ohio valley and Tennessee, 62 to 77; Lower Lakes, 64 to 72; Upper Lakes, 63 to 70; Upper Mississippi valley, 61 to 68; Lower Missouri valley, 60 to 65; Red River of the North valley, 63 to 76; Rocky Mountain Slope, 49 to 66; Plateau districts, 22 to 70; California, 31 to 78; Oregon, 33 to 59. *High stations* report the following averages, not corrected for altitude: Mt. Washington, 83.9; Pike's Peak, 52.3.

WINDS.

The prevailing winds, at the Signal Corps stations, are shown by the arrows flying with the wind on chart No. II. The *maxima velocities* per hour have been given in the descriptions of movements of areas of low pressure.

Total movements of the air—The following were the *largest* monthly movements in miles recorded at the Signal Corps stations: Mt. Washington, 18,638; Cape Lookout, 12,656; Portsmouth, N. C., 11,954; Kittyhawk, 18,982; Cape Hatteras, 10,501; Pikes Peak, 10,470; Sandy Hook, 9,613; Cape May, 9,406; Barnegat, 9,213; Dodge City, 8,661; Indianola, 8,554; San Francisco, 8,264; North Platte, 8,111. The smallest movements were: Silver City, N. M., 848; La Mesilla, 1,148; Fredericksburg, Texas, 1,818; Nashville, 1,920; Graham, 1,928; Lynchburg, 2,019; Tucson, 2,051; Roseburg, 2,144; Deadwood, 2,254; El Paso, 2,322; Visalia, 2,374.

Local Storms—On the 3rd a heavy wind storm at Phoenix, Arizona. 14th, heavy storm at Portland, Maine, blowing down houses, uprooting trees &c., in the adjoining country. From the 17th to the 19th a series of violent storms were reported along the Atlantic coast from South Carolina to Maine in connection with the cyclone which then passed along the coast. 22nd, Biloxi, Miss., whirlwind about one hundred feet wide passed through the centre of the Sea Shore Camp Grounds, demolishing five cabins and taking off a portion of the roof of the tabernacle, scattering it some three hundred feet. Large oak trees were lifted out by the roots and in some instances broken off short. One person fatally and one seriously injured. On the 28th, at 4.20 p. m. a violent gale from the northwest occurred at Fort Keogh, Montana. The wind attained a velocity of 52 miles at 4.45 p. m., and was accompanied by heavy rain and large hailstones, the latter doing much injury. Several buildings were seriously damaged. The storm lasted 35 minutes.

VERIFICATIONS.

Indications—The detailed comparison of the tri-daily weather indications for June with the telegraphic reports for the succeeding twenty-four hours, shows the general percentage of omissions to be 2.44 per cent, and of verifications to be 84.0 per cent. The percentages for the four elements have been, Weather, 92.4; Direction of the Wind, 84.1; Temperature, 83.6; Barometer, 74.7. The percentages of verifications by geograph-